NUTRITION WORK IN THE CITY OF ROCHESTER

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ROBINSON, in "The Mind in the Making," has called attention in a forcible way to the little that is accomplished in changing conditions in human life by training the intellect as compared with what can be brought about by training the intelligence. This is clearly illustrated by the remarkable inadequacy of results obtained from didactic teaching of health facts and rules in comparison with what has been accomplished in Rochester, New York, by investigating actual health factors among its children and appealing to the intelligence of all concerned to bring about improvements in the conditions found.

The city of Rochester has been noted for its progressive activity in community interests and especially in undertakings that have to do with health, yet, as a result of weighing and measuring the children of the city, it was discovered that the proportion of those who were malnourished was high. The Tuberculosis Association acted as the agency in mobilizing the community forces. All of the municipal and social groups dealing with childhood coöperated. The Board of Health, the Board of Education, the University of Rochester, the Chamber of Commerce, the Rotary Club, the Tuberculosis Association, and all other child-helping organizations focussed their energies upon the task of finding a program which would meet the need adequately.

Following an account of the results secured in Chicago from the use of the nutrition class program a delegation was sent from the Board of Education to determine the facts and the advisability of adopting this plan in Rochester. After a careful investigation the committee reported favorably. The previous year much attention had been given in Rochester to the removal of physical defects found in children, especially diseased adenoids and tonsils. Some 17,000 operations had been performed without unfavorable results. In putting this program into effect a fine spirit of coöperation had been developed, and, to an unusual degree, the community had shown confidence in the group of leading citizens who were the chief supporters of the undertaking.

Through the Tuberculosis Association we were invited to meet in conference the executives of the various educational and child-helping groups of the city. Preliminary meetings were held to which the various organizations interested in child welfare sent representatives who united on a definite nutrition program.

These meetings led up to a Nutrition Institute—the first in a series of three held in Rochester in the three years which the nutrition program has been in operation. More than a hundred physicians, teachers, nurses, social workers, and other persons directly interested in the care of children were enrolled in this first institute. The chief ends in view in this course were (1) to inform leaders in the educational and child-helping groups and to atquaint them with the nutrition program, (2) to place the responsibility for carrying out the home and school program squarely upon the community, so as to insure adequate financial and other support, (3) to train workers.

Our program for the work in Rochester was based upon two formulations of experience with malnutrition in connection with work in clinics, schools, and homes. The first of these is the fact that by far the greater number of malnutrition cases are due to one or more of five causes: (1) physical defects, especially

naso-pharyngeal obstructions, (2) lack of home control, (3) overfatigue, (4) faulty food habits and improper food, (5) faulty health habits. The other of these fundamental principles is that in order to overcome malnutrition in a community there must be an effective coördination of four significant forces, no one of which can remain inactive without endangering the success of the efforts put forth by the others. These forces are those of (1) the home, (2) the school, (3) medical care, (4) the child's own interest.

During the campaign against diseased adenoids and tonsils the press of the city had addressed itself especially to the task of helping parents to get a new viewpoint with reference to hospitals and operations. This had succeeded to the extent that one child who did not need an operation was found to have bought the ticket of another child in order that he might share in the enjoyable times reported by those who had already been through the mill. When the nutrition program was put into effect the policy was adopted of furnishing the press with simple, direct news stories which served further to insure to those who were conducting the work the confidence of the public. In many cities the newspapers hesitate to give much space to health work but in Rochester there was no question on this score. As one reporter stated the situation—"The nutrition work is as good as a murder trial—front page, big headlines, everybody looking for it!" Despite this striking statement the material published, while thoroughly interesting, was entirely free from the sensationalism so often judged necessary in attracting the public eye.

Weighing and measuring were the first steps in the actual application of the program. Twenty-eight thousand children were weighed and measured in 1921, and 35,000 in 1922. Approximately 30 per cent were found to be 7 per cent or more underweight for their height. Nutrition classes were organized for the care of the worst cases of these malnourished children. Each school year at any given time 1,500 children are members of the classes in addition to the larger number who receive nutrition instruction in various school groups. In this city, as elsewhere, the largest percentage of underweight was found among children from well-to-do American families. This amounted in a typical school attended by children of "the better class" to 36 per cent, while the percentage ran as low as 23 in a group of those having supposedly inferior health opportunities. Each child placed in a nutrition class was given a physical-growth examination, a social examination, and, in case of need, a mental examination. Nutrition or diagnostic clinics were provided for problem cases which require a greater amount of medical investigation and care than can be given in the routine of the nutrition class.

The classes in the public schools were soon taken over by the Board of Education while those in the parochial and rural schools continued under the direction of the Tuberculosis Association. All school principals and all members of the department of public health education have taken the training course in the nutrition institutes. The school authorities have given the most thorough coöperation on the basis of a recognition of the fact that good health is an essential in making headway in education, and that children who are below par should be brought into good condition before pressure is placed upon them in order to keep them up to fixed standards. The boy or girl who has the misfortune to be absent on account of illness should be put on a modified school program until he has regained the weight lost during his illness, instead of being faced on his return to school by work in arrears which must be "made up" inside of a set limit of time although he is not yet fit for his ordinary tasks. In the parochial schools the priests showed, by their presence in the classes and by

their influence in the homes, an active interest in this health work.

Evidence as to the good effect of this educational policy manifested in improved conditions and work, is found in the general approval of school principals and teachers, most of whom have taken the nutrition institute course. Children who have been given simplified programs in school so that time might be taken for additional rest periods, for instance, have shown on their return to full schedules when they were back to normal condition, that they were able to do their work much more effectively than had been possible before the beginning of the new regimen.

One of the fundamental requirements of the program is the attendance at nutrition classes of the parents of the children belonging to them. Each time that a study has been made it has been strikingly shown that the cities which have insisted upon meeting this requirement secured a much higher percentage of gain than was made by the classes in which laxness was permitted in this respect. In Rochester it was found that in a group of 25 nutrition classes the five best classes made an average gain of 480 per cent of what average children of the same ages would be expected to make, while the five poorest made an average of 196 per cent. The first five averaged 149 attendances of parents, while the lowest five averaged only 83. When this is reduced to more exact figures of the relation in percentages of parental to child attendance the respective showings for the two groups are 52 and 31 per cent.

The average initial underweight of 494 children in the 25 classes was 11.3 per cent and the final underweight at the end of a three months period was 6.6 per cent. This means that in this period 42 per cent of the initial underweight had been overcome. This is a measure which is not commonly used, but which has some definite advantages in comparing the work of various classes. The usual method has been to compare the percentage of gain made by the groups under consideration. In this particular study while the general range of the classes on the two bases is the same there are some marked exceptions. Special conditions may favor the average gain in a school which has not really lifted as heavy a load of underweight as has another school which has made a lower average of gain. The best school in this respect had reduced its underweight 72 per cent while the poorest had made a reduction of only 20 per cent. The best school on the basis of the percentage shown by the relation of the actual gain to the gain expected for children of these ages made 554 per cent while the lowest made 159 per cent. The school which made the greatest reduction in the load of underweight made an average gain of 69 per cent less than the school ranking first in the relation between actual and expected gains. On the other hand, the school making the greatest per cent of gain made 14 per cent less reduction of the load of underweight than did the other.

The average gain for the 25 classes in the public schools was 305 per cent. In the public schools about 35 per cent of the graduates had entered the safety weight zone in three months or less. About 45 per cent accomplished this improvement in from 13 to 18 weeks, 11 per cent in 19 to 26 weeks, and 9 per cent required more than half a year. It is suggestive to find that the percentage of gain made by the children during the entire period in which they were under observation was in inverse ratio to the gain made before graduation. That is to say, that in general those making the most rapid initial improvement did not make as good progress during the entire time as did those who gained somewhat more slowly. It must be remembered in this connection that those in the classes for a longer time had more opportunity to get their new health habits well established and also less time to fall away from their better

health and food habits than had those who had graduated sooner.

In a comparison of initial underweight with conditions at the end of the period of observation, that is to say, 16 months after leaving the classes, it was found that 81 per cent were better off than they were at the time when they first entered the classes. Sixty-three per cent of the graduates were still in the safety weight zone 16 months after beginning the program.

Records had been kept of the extent to which many of the children had continued, after graduation, to observe the instructions given them with reference to lunches, rest periods, etc. On this basis they were divided into four groups having at one extreme those who after graduation had paid practically no attention to the directions given them in class, while at the other extreme were those who had followed instructions most faithfully. The measure taken in this case was the ratio between initial underweight and final condition. It was found that the group paying most attention to instructions made more than double the progress accomplished by those who neglected the directions given them. Using the measure of persistence in the safety weight zone up to the end of the period of observation, those who followed instructions had more than twice as many in this zone at the end of the time as had those who failed to keep them.

A study had already been made of two groups of Rochester children, numbering 2,127 and 953 respectively, with reference to the relationship of underweight and overheight. It was clearly shown in a comparison made between those who were 10 per cent or more above average weight for height with those 10 per cent or more below average weight for height that the underweight children were taller for their ages than were those in more normal condition of weight.* This was more marked in the older children than in those in the earlier years. In studying the graduates of the nutrition classes it was found that a closer classification could be used and they were divided into those 10 per cent or less underweight for height and those who were more than 10 per cent underweight. In both the public school and the Tuberculosis Association groups the children who were more underweight ran taller for their ages than did those of less underweight. This was true of both sexes. The most marked difference was in the public school girls who showed 3 per cent greater height for the increased underweight group than was found in those 10 per cent and less underweight for height. In general, the height for age of the public school children exceeded that of the children in the parochial and other schools in charge of the Tuberculosis Association. Several groups of children attending private day and boarding schools in other sections of the country showed greater height for age than appeared in the Rochester public school children. It is noteworthy that the group of public school nutrition class graduates here studied averaged even greater height for age than was found among the private school pupils.

One of the problems met by the nutrition worker is the fact that as fast as children who are underweight make gains in weight their height increases as well and the new height calls for additional weight. This study shows that there has usually been a retardation in height as well as in weight and that as soon as there is an improvement in weight, height begins to increase. Instead of the dictum recently made by a prominent investigator to the effect that if one will look after the inches the pounds will take care of themselves it is evident that a large group of children already have more inches than they are able to sustain by pounds and that the best way to get them started toward more inches is to make conditions favorable for increasing their weight, or, it would be better to say, conditions favorable for normal growth.

* Figures available on request.

When the graduates were grouped according to their persistence in the average weight zone it was found that those who had continued in this zone until the end of the period of observation had made rather more than the expected gain in height, but that those who had relapsed into the borderline weight zone (less than 7 per cent underweight for height) had averaged 25 per cent more height increase while those who were finally again in the danger zone (more than 7 per cent underweight for height) had made 50 per cent greater height increase than had the first group.

Much credit for the results secured is due to the physicians of the city who have recognized the importance of this work as an opportunity in preventive medicine. There is evidence of an increasing realization among the medical profession of the significance of physical defects and of the conditions which bring about overfatigue. The diagnostic clinics established in the Rochester hospitals, corresponding with the work of the physicians in the nutrition classes, helped to set more definite standards to which children must be brought before progress can be expected—that of being "free to gain." The third of our institutes was held in the Eastman Dental Infirmary and part of the program was given to the results of research which is showing that work with teeth must be kept closely associated with the general development of bone structure and condition of the body.

The various child-helping organizations following the lead of the Rochester Tuberculosis and Public Health Association, as the Tuberculosis Association is now called, have been large factors in the progress achieved. The school authorities have shown a new and remarkable state of mind in realizing the common sense of not attempting to force undernourished children to try to keep up with the pace set for normal children. There has been no difficulty in securing adjustments of program in either public or parochial schools. The part played by the clergy of the various parishes in the latter schools has been very valuable. In the public schools the work is in charge of the Department of Health Education. This has made it possible to modify the work in physical exercise and relate it to growth and development. Credit is given for rest periods as much as for exercise periods. Time and place are found for rest periods as a matter of course. The summer camp is a regular feature in meeting the needs of children who require full time supervision in order to gain an impetus toward increased weight and proper food and health habits.

The term already used to designate this situation—a community job—is well justified in the interest and support given to it by children and parents. The public exercises attending the "graduation" of the first two hundred who had come up to the average weight line was an event not only to the families directly concerned but to all the children in the schools and to their parents. The permanence of results having this support cannot help but be greater than in the case when the strong tide of public opinion is not utilized as one of the motive forces of the movement. The gratitude of parents has been freely expressed not only with reference to the direct health instruction and increased health, but also for the attitude of the school and health authorities in making the attainment of health the first and fundamental factor in educational progress. In Rochester all of this shows a new appreciation of the old adage, "a sound mind in a sound body."

SUMMARY

1. The percentage of gain made by various groups of children is found to be in direct relation with the attendance of parents at nutrition classes. A group of five schools making the best average gain—480 per cent—had 52 per cent of parents present, while a group of five showing the poorest gain—196 per cent—

had only 31 per cent of parental attendance.

2. In three months a group of 25 schools reduced its initial underweight by 42 per cent. The school making the best record made a reduction of 72 per cent while the poorest record was 20 per cent.

3. About 35 per cent of the graduates came up into the safety weight zone in three months and less, 45 per cent in 13 to 18 weeks, 11 per cent in 19 to 26 weeks, and 9 per cent required more than six months to graduate.

4. Sixty-three per cent of the graduates were still in the weight safety or borderline zones—less than 7 per cent underweight for height—at the end of 16 months spent in nutrition classes and under observation.

5. Those children who had continued to follow the directions given them in the nutrition classes more than doubled the record of gains made by those who were less attentive to class instruction. Those who had followed directions also showed double the persistence in remaining in the safety weight zone as compared with those who did not.

6. Children who are underweight for height are taller for their ages than are those who are in more nearly normal relation of weight to height.

7. A comparison of the members of various school groups with reference to height for age showed greater height for age among the pupils in leading private day and boarding schools than was found among those in the Rochester schools. The children graduating from nutrition classes in the public schools of Rochester were on the average taller for age than were the members of the private day and boarding schools.

8. Graduates of nutrition classes who had relapsed into the danger zone at the close of the period of observation had made 50 per cent greater increase in height, and those in the borderline zone 25 per cent greater increase in height for age than had those who remained in the safety weight zone.

9. The advance in weight sufficient to bring children up into the safety weight zone is accompanied by more than the expected increase in height for the same period.

10. The coördination of all the forces in this community working to raise the standards of child health has accomplished results, shown by an average gain of 305 per cent among 1,000 children, which challenges the attention of all other communities interested in the difficult problem of malnutrition.

STATISTICAL TABLES

(The following tables give a brief summary of the material worked upon. Detailed information will be furnished anyone who may be interested.)

Sex

	Cases	Percentage Male	Female	Average percentage underweight
Nutrition classes	490	50	50	11.5
Graduates	165	48	52	9.6

Persistence at end of period of 16 months after entering class

	Normal and borderline weight zones Percentage	Underweight Percentage
Male.....	71	29
Female.....	62	38
Both sexes.....	66	34

Relation of following class directions (after graduation) to permanence of results and to underweight reduced

	Followed directions In full	In part	Not at all	Entire group
Ratio between initial and final underweight	3.6	1.9	1.6	1.9
Remaining in borderline and safety weight zones 16 months after entering class, percentage	78	65	58	63
Again underweight, percentage	22	35	42	37

Time required for graduation

	Male Per cent	Female Per cent	Both sexes Per cent
12 weeks and less...	37	33	35
13 to 18 weeks.....	38	51	45
19 to 26 weeks.....	14	8	11
More than 26 weeks.	11	8	9
	100	100	100

Attendance of parents in relation to percentage of gain

	Percentage Actual of expected gain	Percentage Attendance parents
5 schools making best gain...	480	52
5 schools making least gain...	196	31

Reduction of underweight

	Average percentage underweight reduced
25 schools	42
Best record	72
Poorest record	20